

Rujul Gandhi

Education

2018 - 2023 **Massachusetts Institute of Technology**

- MEng 2023 in Electrical Engineering & Computer Science, Concentration in AI. GPA: 5.0.
- MEng Thesis: *Identification of Atomic Propositions in English Instructions for Flexible Translation to Robot Planning Representations*.
- SB 2022 in Linguistics, Electrical Engineering & Computer Science. GPA: 4.7.
- Coursework: 6.011 *Signals, Systems, and Inference*, 6.036 *Machine Learning*, 9.390 *Language in the Brain*, 6.806/6.884 *Advanced Natural Language Processing*, 24.962 *Advanced Phonology*, 9.660 *Computational Cognitive Science*

Research

Oct 2023 - **Associate Specialist in Speech Neuroscience, UC San Francisco**

- Current
- Using computational techniques to model the brain's response to natural speech.
 - Supervisors: Shailee Jain (immediate), Edward Chang

Sept 2022 - **Graduate RA in NLP, Reliable Autonomous Systems Lab, MIT AeroAstro**

- June 2023
- Using pretrained language models to convert natural language constraints into logical representations for robotic planning.
 - Work resulted in an MEng thesis and a conference paper.
 - Supervisor: Chuchu Fan

Jan 2022 - **UROP in Emergent Communication, Interactive Robotics Group, MIT CSAIL**

- May 2022
- Worked on reinforcement learning experiments to study emergent communication between collaborating neural network agents.
 - Supervisors: Mycal Tucker (immediate), Julie Shah

Mar 2020 - **UROP in Phonetics & Acoustics, MIT Linguistics**

- May 2022
- Conducted a study of retroflex production in the context of language interaction.
 - Responsibilities included experiment design, audio data collection and annotation using Praat, and data analysis using R.
 - Supervisor: Edward Flemming

Industry Experience

June 2023 - **Building speech recognition for low-resource languages, MIT-IBM Watson AI Lab**

- August 2023
- Summer internship carrying out research and software implementation for improved speech technology.
 - Supervisor: Yang Zhang

June 2021 - **Engineering prosthetic voices, VocaliD**

- Aug 2021
- Interned at a voice AI company creating synthetic voices for individuals and organizations.
 - Quality tested voice synthesis output, automated data compilation, and helped expand the company's reach into new languages and services.

Dec 2020 - **Connecting refugees to interpreters, Tarjimly**

- Feb 2021
- Established global partnerships for a tech nonprofit that provides on-demand interpretation and translation.
 - Designed a language tree feature specification to improve beneficiary-interpreter matching in the Tarjimly app.

Conference Abstracts/Papers

- 2024 **Deep neural networks reveal context-sensitive speech encoding in single neurons of human cortex**, *S Jain, R Gandhi, S Hu, MK Leonard, EF Chang*
- Computational Systems Neuroscience (CoSyNe) 2024 - Selected for oral presentation
 - Computational Cognitive Neuroscience (CCN) 2024 - Selected for oral presentation
 - From Neuroscience to Artificially Intelligent Systems (NAISyS), CSHL 2024 - Selected for oral presentation
 - Advances & Perspectives in Auditory Neuroscience (APAN) 2024 - Selected for poster highlights
 - Society for Neuroscience (SfN) 2024 - Selected for nanosymposium
- 2023 **NL2TL: Transforming Natural Languages to Temporal Logics using Large Language Models**, *Y Chen, R Gandhi, Y Zhang, C Fan*
- EMNLP 2023

Awards and Fellowships

- 2023 SERC (Social and Ethical Responsibilities of Computing) Scholar, MIT Schwarzmann College of Computing
- 2021 Burchard Scholar, MIT School of Humanities, Arts, and Social Sciences

Teaching

- Jan 2022 - **Part-time Tutor**, *Inspire AI, Middle School Program*
- May 2023
- Led 5th-8th graders through online programs covering introductory Python exercises, concepts of machine learning, and discussions on AI ethics.
 - In addition to summer and winter intensive programs, was the lead instructor for school partnerships with the Hun School of Princeton (Summer 2022) and the Valley School of Ligonier (2022-23 Academic Year).
- Fall 2021 **Teaching Assistant**, *9.19: Computational Psycholinguistics*
- Spring 2021 **Lab Assistant**, *6.009: Fundamentals of Programming*
- Jan 2020 **MIT Global Teaching Labs**, *Nazarbayev Intellectual Schools, Kazakhstan*
- Taught workshops on linguistics and molecular biology to high school students.

Skills

- Technical: Python, ML Libraries (PyTorch, Tensorflow), R, SQL, Praat, C/C++
- Languages: English (native), Marathi (native), Hindi (fluent), Urdu (fluent), German (elementary), Sanskrit

Activities

- Feb 2019 - **MIT Educational Studies Program**
- Feb 2022
- Director, Splash 2020: Designed the first virtual version of ESP's largest annual educational program.
 - Co-directed educational programs serving thousands of students and hundreds of volunteer teachers.
- Sept 2019 - **Asia-Pacific Linguistics Olympiad**
- Sept 2021
- International Jury Chair and Member of the Board for APLO 2020 and 2021. Member of the jury, APLO 2019. Problem Committee Chair for Panini (Indian national) Linguistics Olympiad, 2023-2025.
 - Directed the efforts of 11 jury members to create multilingual problem sets featuring language-based logic puzzles, for participants across the Asia-Pacific region.
- Sept 2021 - **MIT Women's Lightweight Crew.**
- May 2023